Sales of Fuel Oil and Kerosene in 2000

Fuel oil sales in 2000 can be characterized by continuation of long-term trends in both the distillate and residual fuel oil markets. Overall distillate demand increased for the ninth consecutive year, to reach an all time high of more than 59.6 billion gallons. Buoyed by the continued strength of the U.S. economy during 2000, total distillate sales increased 3.5 percent over the level of sales achieved in 1999. By comparison, the residual fuel oil market continued to shrink in comparison to 1999. Despite the continuation of the long-term down trend in sales that with the exception of 1996 and 1998, has characterized the residual fuel oil market for more than a decade, the rate of decline slowed to 0.9 percent compared to the drop of 9.5 percent the year before. Total sales of kerosene also decreased, dropping 7.3 percent from the level set in 1999.

Distillate sales accounted for an even greater share of the fuel oil market in 2000 than they had in 1999. (Distillate sales accounted for 80.7 percent of total fuel oil sales compared to 79.9 percent in 1999). Once again, the shift in the proportion of total fuel oil sales came primarily as the result of declining sales to the electric power sector. Residual fuel oil sales fell below eighteen percent of total fuel oil sales, accounting for 17.9 percent of total fuel oil sales for the first time.[1] Kerosene sales accounted for the remaining 1.4 percent of total sales.

Distillate Fuel Oil

Despite a year sharply higher prices for petroleum products, sales of distillates in 2000 increased to a record 59.6 billion gallons. The year-to-year volume increase of 3.5 percent in total U.S. sales represented a jump in consumption of more than 2 billion gallons. Once again, the strong demand resulted in large measure from the continuation of economic growth during most of the year. The economy as measured by Gross Domestic Product (GDP) grew 5.0 percent for the year compared to an increase of 4.2 percent in 1999. At the same time, unemployment fell to 4.0 percent, its lowest point since 1970.[2]

Table HL1. Volume Distribution of Distillate and Residual Fuel Oils, 1999 and 2000

End Use	Distillate 2000		Distillate 1999		Residual 2000		Residual 1999	
	Volume (million gallons)	Percent Share	Volume (million gallons)	Percent Share	Volume (million gallons)	Percent Share	Volume (million gallons)	Percent Share
Residential	6,830	11.5	6,302	11.0	—	—	—	—
Commercial	3,706	6.2	3,338	5.8	664	5.0	646	4.8
Industrial	2,331	3.9	2,478	4.3	1,585	12.0	1,700	12.8
Oil Company	686	1.2	659	1.2	154	1.2	124	0.9
Farm	3,455	5.8	3,412	5.9	—	—	—	—
Electric	1,015	1.7	816	1.4	4,363	33.0	4,990	37.4
Railroad	3,291	5.5	3,239	5.6	—	—	—	—
Vessel Bunkering	2,261	3.8	2,419	4.2	6,410	48.5	5,838	43.8
On-Highway	33,130	55.6	32,062	55.7	—	—	—	—
Military	306	0.5	357	0.6	28	0.2	26	0.2
Off-Highway	2,589	4.3	2,490	4.3	—	—	—	—
Other	0	0.0	0	0.0	7	0.1	4	0.0
Total	59,600	100.0	57,572	100.0	13,211	100.0	13,328	100.0

Sources: Energy Information Administration, Form EIA-821, "Annual Fuel Oil and Kerosene Sales Report," 1999 and 2000.

[1]Sales of residual fuel oil to the electric power industry surged in 1998 and exceeded 20 percent of the total fuel oil sales for the first time since 1994. For details, *see Sales of Fuel Oil and Kerosene*, Energy Information Administration, 1999, p 4.

[2]GDP data are from: *Economic Indicators*, April 2001, Washington D.C. U.S. Government Printing Office, p1-2, 19; Employment statistics are from Economic Indicators, P. 12.

Demand for on-road diesel reached another all-time high in 2000, increasing to 33.1 billion gallons, accounting for roughly 56 percent of total distillate demand.

Despite a winter slightly warmer than normal in the key regions for heating oil sales, sales of distillate to the residential sector increased by 8.4 percent to 6.83 billion gallons. For the U.S. in general, the winter weather was about 2.5 percent warmer than normal, but about 5.1 percent colder than the previous year. However, in New England the winter was only 0.2 percent warmer than normal and 7.4 percent colder than in 1999.

Commercial use of distillates, driven by both the strength of the economy and by the colder temperatures, increased 11.0 percent, or 364 million gallons, to 3.7 billion gallons. Sales to the industrial sector decreased by 146 million gallons to total 2.3 billion gallons.

Despite sharply higher prices for distillate fuel, the strength of the economy coupled with the fact that energy prices in general were significantly higher than during 1999 bolstered distillate sales, and contributed to increases in distillates sales in nearly every sector of the market. The residential and commercial sectors benefited: as total expenditures for new construction grew by 5.68 percent.[3]

Off-highway diesel, a sector heavily dependent on construction orders, also grew as a result of the healthy economy and new construction activity. Off-highway sales increased 99 million gallons, or 4.0 percent, to 2.6 billion gallons.

Direct use of distillates by oil companies increased as drilling and other oil and gas company activities increased as higher prices drove increase exploration and development activity during the year. The number of rotary rigs for the years averaged 918, or about 47 percent over the average of 625 rotary rigs in 1999. The increased in company activity, driven by the high crude oil and natural gas prices during much of the year, resulted in total demand of 686 million gallons, or 27 million gallons above the total for the previous year.[4]

Sales of distillate to the agricultural sector were mixed largely as the result of widely varying weather conditions raging from drought to unusually favorable conditions. The drought plaguing much of the South and West reduced the wheat crop and in general curtailed demand in the affected regions. In the farm belt of the mid-continent, conditions favored the farmer and stimulated demand for distillates as the highest level of soybean production on record and the second largest corn harvest in history were recorded. Nationally, sales to the agricultural sector increased slightly, totaling nearly 3.5 billion gallons up about 43 million gallons or 1.3 percent from the level achieved in 1999.[5]

Reflecting fundamental changes in the utility sector, distillate sales to electric utilities surged, to an all-time high. Sales increased by nearly 200 million gallons or 24.4 percent. For the first time, total distillate sales to the utility sector exceeded one billion gallons. A combination of factors fostered the jump in sales. Although record high prices for natural gas made oil more attractive to those with fuel switching capacity, structural changes in the electric power sector also played a significant role in the shift in fuel use.

Restructuring of the electric power industry is changing patterns of fuel use. As utilities were either required to or voluntarily decided to divest generation assets changes occurred not only in ownership but also in how the plants are operated. Some plants, especially older less efficient units have become peaking units rather than base load units. Now, often running just when economic conditions justify, such plants are less sensitive to fuel costs. They may blend distillate with residual fuel oil, mix it with natural gas or even when equipment and conditions warrant burn only the lighter lower sulfur exclusively in order to meet increasingly stringent environmental restrictions. In addition, concern in some areas of the country about the ability of the electric power system to meet peak summer demand led to the instillation of addition smaller peaking units that typically run on distillate as an alternative to natural gas or simply run on distillate exclusively.

Sales of distillate to railroads increased for the second consecutive year. The gain was slightly less than in 1999 at 1.6 percent, an increase of nearly 52 million gallons for a total of 3.29 billion gallons. Sales to railroads were at the highest level since 1996.

[3]E*conomic Indicators, April 2001,* Government Printing Office, p.19.

[4]The number of working rigs at year-end, increased by nearly 50 percent from 625 in 1999 to 918 in 2000. U.S. Average Rig Counts by State, Baker Hughes (Hughes Christensen), 1999, 2000. See also, EIA *Monthly Energy Review,* Table 5.1.

[5]Department of Agriculture, National Agricultural Statistics Service, *Statistical Highlights 2000 & 2001: Overview, U.S. Crop Summary,* p 4-5.

Despite the overall strength of distillate sales, not all sectors of the distillate market improved. Sales of distillates for vessel bunkering declined by 6.5 percent to less than 2.3 billion gallons, the lowest level of sales since 1994. Sales to the military sector declined about 50 million gallons for a year total of 306 million gallons.

On a regional basis,[6] the increase in sales of distillate to the residential market usage limited to PAD District I (the East Coast). Total distillate sales in the PAD District reached 5.9 billion gallons, an increase of 11.1 percent. Although sales increased throughout the region, the largest increase occurred in Subdistrict IB, the Middle Atlantic, where sales increased by 14.1 percent.

Sales in Subdistrict IA, the New England, were boosted by an unusually strong cold snap in January that resulted in a pronounced price spike.[7] The severity of the weather exacerbated market conditions by impeding delivery of both oil and natural gas to some areas. The result: prices for both natural gas and heating oil (already pushed higher because stocks of both products were low) surged in mid-January.

The price spike was limited to the Northeast where consumption of heating oil is concentrated, although the region accounts for only about 22 percent of total demand for distillate fuels, approximately 80 percent of the total U.S. heating oil demand occurs in the region. Some larger customers of natural gas whose service was interrupted or who had voluntarily switched to distillate fuel added pressure to an already stressed distillate market. Spot heating oil prices (New York Harbor) rose 133 percent between January 14 and February 4, 2000 and prices in New England increased by two-thirds from $1.18 to $1.97 per gallon.[8]

Sales of distillate to the residential sector in all other PAD districts declined, primarily as the result of milder than normal winter temperatures.

Commercial volumes similarly increased the most in PAD District I, particularly in the Northeast, where distillate sales increased 22.2 percent, or nearly 120 million gallons, for total sales of 658 million gallons. Overall sales of distillate to the commercial sector in PAD District I, totaled 2.3 billion gallons.

As would be expected with higher crude and product prices, oil companies increased exploration and development activities. Consequently, distillate sales for direct use by oil companies increased. The most pronounced increase occurred in PAD District III (the Gulf Coast) where the majority of oil production takes place in the United States. Oil company direct usage in the Gulf Coast region increased by 39 million gallons to total 544 million gallons and account for nearly 80 percent of total oil company sales.

While the drought lessened demand for distillates in the agricultural sector of PAD District III, the region's warmer than normal summer boosted demand in the utility sector. Sales in the region increased by 207 million gallons from just 41 million gallons the previous year.

Sales of distillate fuels to the utility sector were mixed on a regional basis, increasing in PAD District I, PAD District III, and PAD District IV (the Rocky Mountains). Sales declined in PAD District II (the Midwest) a major coal-consuming region and in PAD District V (the Pacific Coast). Sales in PAD District V may have been adversely affected by developments late in the year in the electric power market in California.

Residual Fuel Oil

Once again, as overall sales of residual fuel oil fell, the utility sector was primarily responsible for the bulk of the drop in sales of approximately 117 million gallons. Nonetheless, both the magnitude of the overall drop in total residual sales and the drop in utility sales were considerably more moderate than was the case in 1999. Total sales of residual fuel dropped by less than one tenth as much as during 1999, and the drop in utility sales represented about 40 percent the size of the decline that occurred in 1999. For the third consecutive year, bunker sales increased sharply thereby helping to counterbalance the decline in sales to the utility market.

[6]The U.S. is divided into 5 Petroleum Administration for Defense districts (PAD District). District I, East Coast, District II, Midwest, District III, Gulf Coast, District IV, Rocky Mountains, and District V, Pacific Coast, PAD District I is broken into three subdivisions: Subdistrict IA, New England, Subdistrict IB, Middle Atlantic, and Subdistrict IC, Southeast.

[7]Seasonal price increases for both natural gas and heating oil are the norm during the winter months as demand for both products increases sharply and inventories diminish as temperatures drop. Each year, to prepare for the coming winter, refiners step up production of heating oil and gas producers build gas storage inventories well in advance of the onset of colder weather. Nonetheless, circumstances may combine to produce unusual seasonal patterns that result in dramatic swings in price, where prices spikes well above typical winter highs.

[8]For a more detailed account of the dynamics of the winter 1999-2000, please see: *Impact of Interruptible Natural Gas Service on Northeast Heating Oil Demand*, Energy Information Administration, Office of Oil and Gas, Washington, January 2001.

In recent years, restructuring of the electric power sector has contributed to a fundamental change in the patterns of fuel purchase and use by electric power generators. Over the past three years, sales of residual fuel oil to the electric power sector have fluctuated greatly. In 2000, sales declined by 627 million gallons, a drop of 12.6 percent. Despite the magnitude of the drop, sales to the electric power sector fell by less than 45 percent as much as they did in 1999 compared to 1998.[9] Falling demand responded to weather, prices of competing fuels, changing practices in the electric power sector, and environmental constraints. Despite cooler temperatures than were experienced the previous winter, the heating season of 2000 was still milder than normal.[10] Although much of the country experienced warmer than normal summer temperatures, the principal fuel oil consuming areas experienced a cooler than normal summer.[11]

Prices for fuel rose sharply in late 1999 and remained at their highest levels in years for most of 2000. The prolonged period of higher prices acted as a window of opportunity for residual fuel to compete favorably at times with natural gas and even occasionally with coal. However, increased flexibility in fuel use and plant operations as more plants were divested becoming merchant plants where blending of fuels to achieve greater efficiency and to lower emissions of dirtier fuels (oil blended with natural gas and even oil and coal), choosing to purchase power rather than generate electricity or to buy and re-sell fuel contracted for reduced the advantage that fuel oil might have had under similar circumstances just a few years earlier.

Finally, environmental constraints on the operation of plants further reduced the demand for heavier higher sulfur fuel oils and stimulated sales of lighter oil to the electric power sector (see above). As was the case in 1999, the drop in sales of residual fuel oil the electric power sector overwhelmed the gains made in the bunker market and resulted in the overall demand for residual fuel oil falling slightly by 1.0 percent in comparison to 1999.

The drop in total sales of residual fuel oil should be viewed in the context of the long-term decline in sales of approximately 40 percent between 1987 and 2000. Although price volatility and other considerations, such as the sustained outages of facilities,[12] may result in significant increases in regional or even national sales of residual fuel to the utility market for any given year, such conditions as occurred in 1998 are unlikely to be long-term. Nationally, as new power plants come on line, most will be gas fired further reducing demand. The drop in sales during 2000 fits the long-term well-established trend of declining sales of residual fuel oil. Regionally, the New England market will continue to shrink significantly as gas flows into the region from Sable Island reach their expected levels. Nonetheless, residual fuel oil sales will remain a viable niche market, serving as back-up fuel, stock, safety valve, and hedging tools in the electric power market.

Sales of residual fuel oil to the industrial sector declined in 2000 as it had in 1999 and 1998. The drop in industrial sales of residual fuel oil was greatest in the New England region of PAD District I and in PAD District V along the Pacific Coast.

Reversing the impact of low prices during 1998 and the early months of 1999, higher crude oil and product prices led to increased spending by oil companies for exploration, development, and other projects.[13]

The bright spot in residual sales remained the bunker market. Bunker sales increased by 9.8 percent, 572 million gallons, up sharply from the robust sales of 1999 when sales increased by nearly 4 percent. Bunker sales increased in every region of the U.S. with the exception of Pad District IV where bunker fuel is not marketed. The largest increases occurred in the Middle Atlantic and Southeastern portions of PAD District I and in PAD District III along the Gulf Coast. Sales in the Gulf Coast were boosted by favorable arbitrage opportunities as coker outages resulted in a glut of bunker in the region. Favorable economics also helped to boost sales in a number of small niche markets such as Mobile and Baltimore over such ports as New York and Philadelphia. Although sales increased only 2.8 percent in PAD District V, that region experienced a significant increase in 1999 of more than 20 percent.

[9]Unusual conditions combined in 1998, to propel sales to electric utilities to 1.8 billion gallons. Sales in 1999 and again in 2000 have moved back into a pattern common over the past several years of generally falling demand.

[10]The U.S. as a whole was 5.1 percent colder than in 1999 as measured in heating degree-days but was still 2.5 percent warmer than normal. The only exceptions were New England recording a winter 7.4 percent cooler than in1999 and 0.2 percent colder than normal.

[11]Summer temperatures in New England, the Middle Atlantic and the East North Central regions of the country were between 8 and 12 percent cooler than normal. In New England, the summer was some 37 percent cooler than in 1999 and the Middle Atlantic, which was just 24.4 percent cooler, and the East North Central was 17.6 percent cooler.

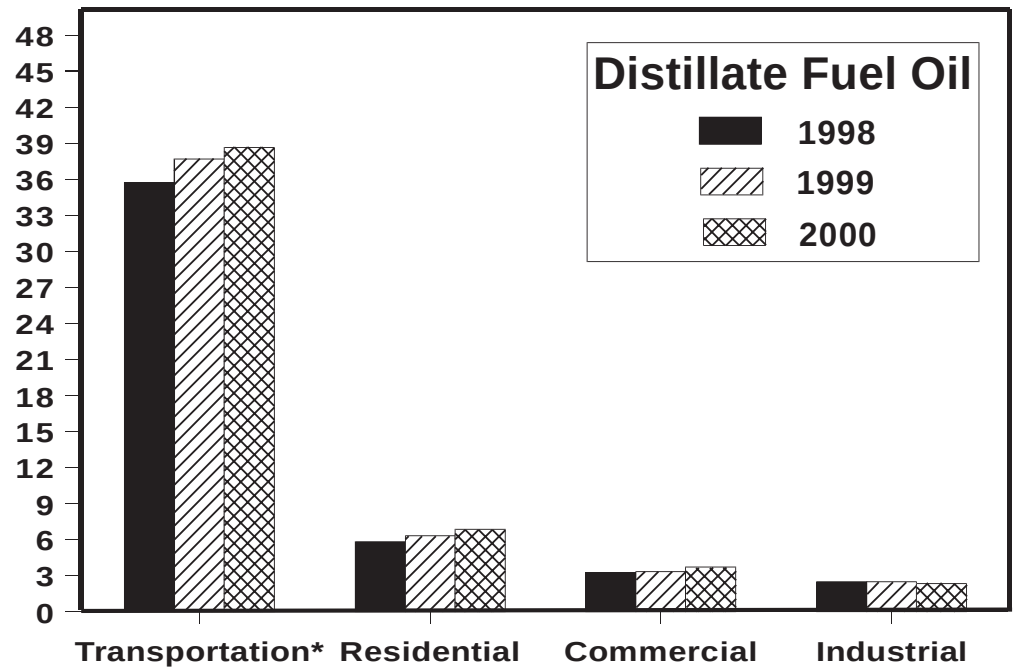
[12]For example, the outage of several nuclerar plants that boosted sales in the New England regional market in 1997 and 1998.

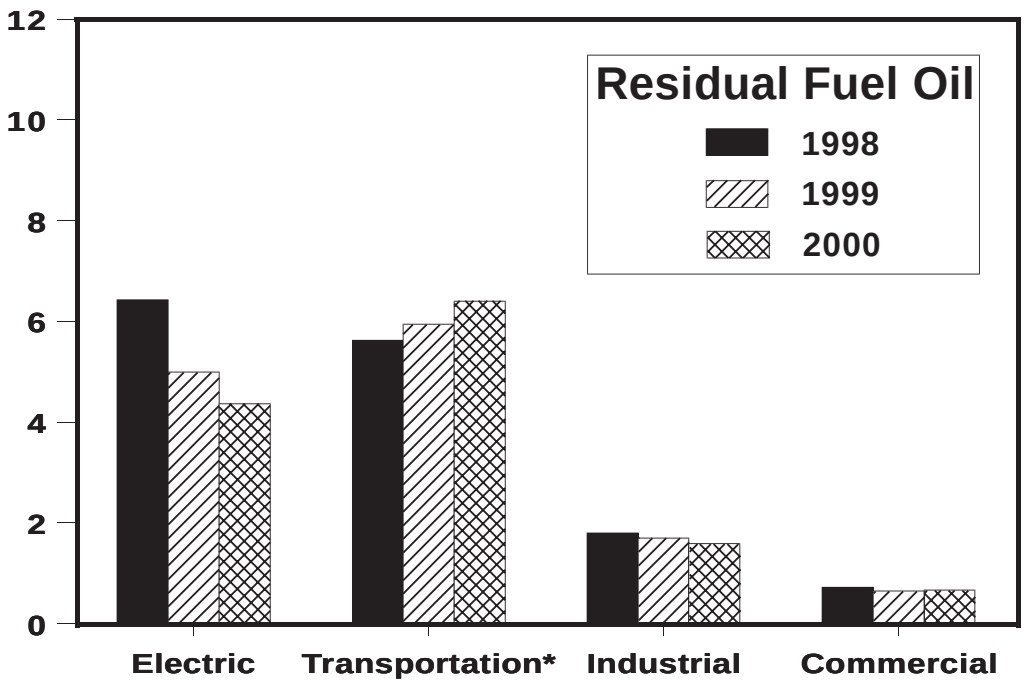
[13]See footnote 4 for details.

Kerosene

For the second year in a row, kerosene sales fell, remaining just over 1 billion gallons. Sales fell by 7.3 percent compared to a drop of 6.6 percent in 1999. Sales to the commercial sector increased by nearly 20 million gallons, a jump of 10 percent. Counteracting that increase, sales to the residential sector fell but still accounted for approximately 68 percent of total kerosene sales followed by the commercial sector at approximately 21 percent.

Figure HL1. U.S. Sales of Distillate and Residual Fuel Oils by End Use, 1998-2000

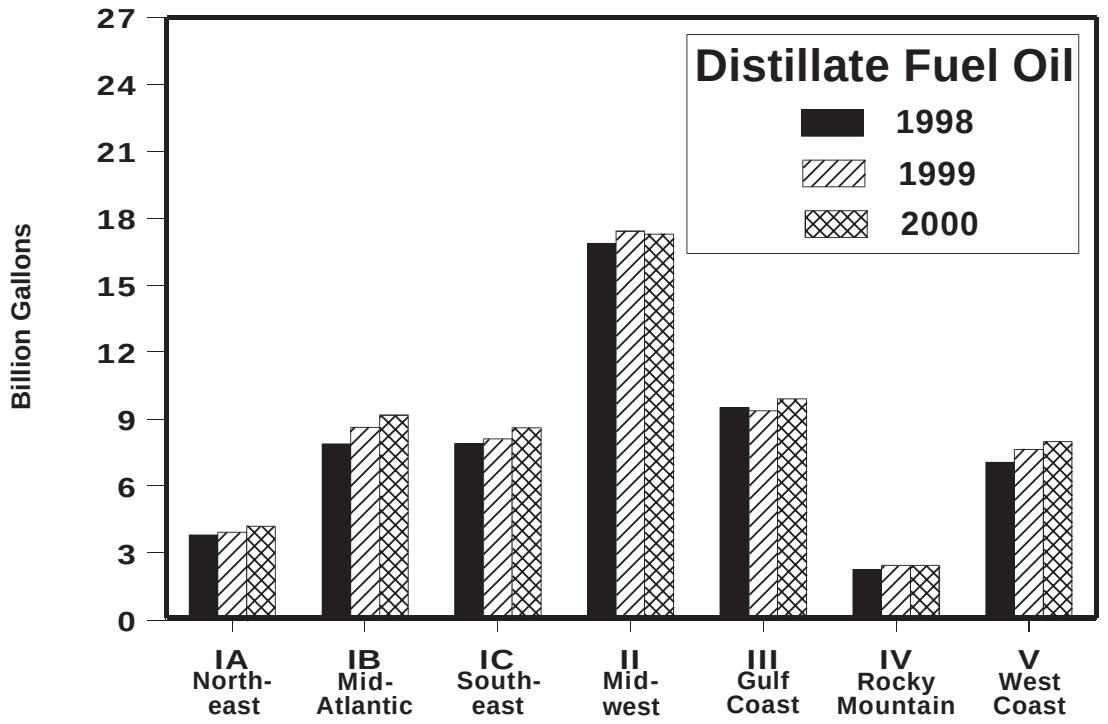


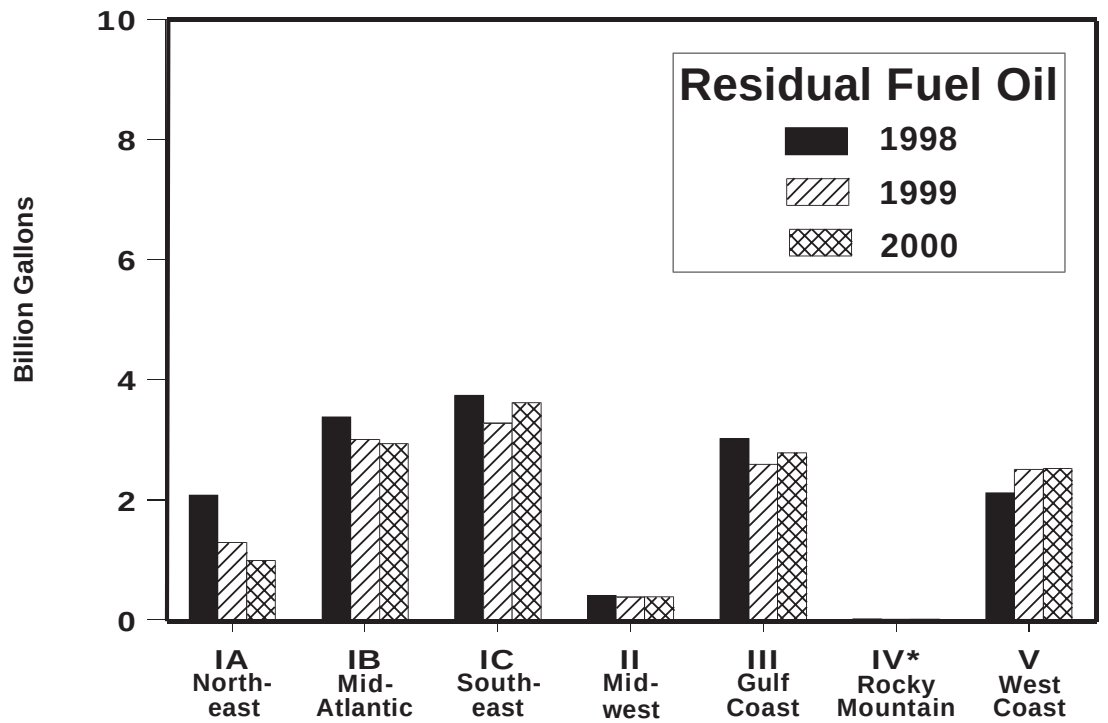


*For distillate fuel oil, transportation use comprises railroad, vessel bunkering, and on-highway diesel end-use categories. For residual fuel oil, transportation use comprises the vessel bunkering end-use category.

Sources: Energy Information Administration, Form EIA-821, "Fuel Oil and Kerosene Sales Report," 1999 and 2000.

Figure HL2. Volume Distribution of Distillate and Residual Fuel Oils by PAD District, 1998-2000



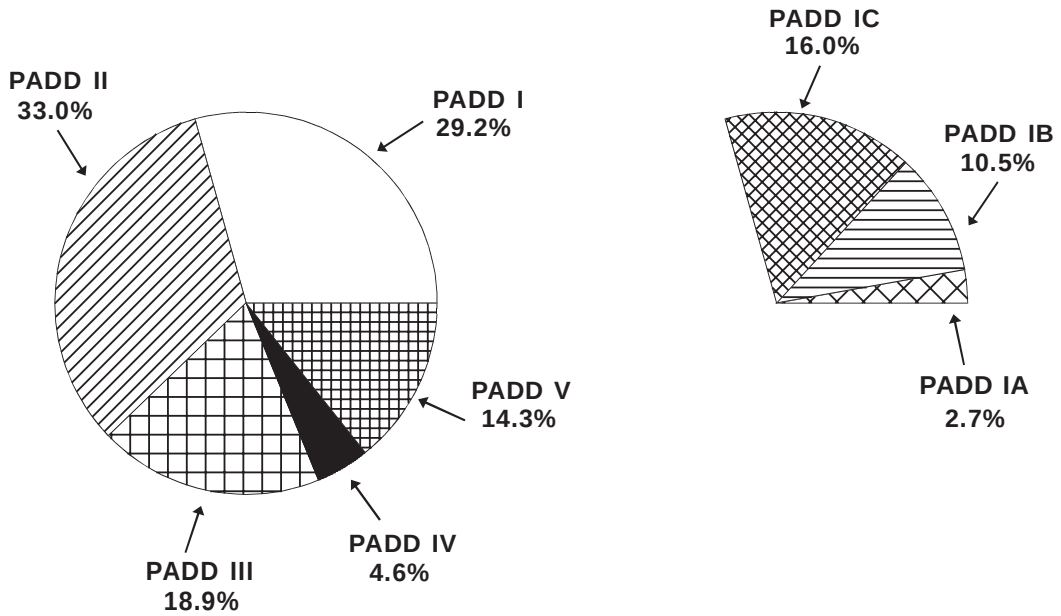


*Residual fuel oil sales in PAD District IV are too small to appear in this graph.

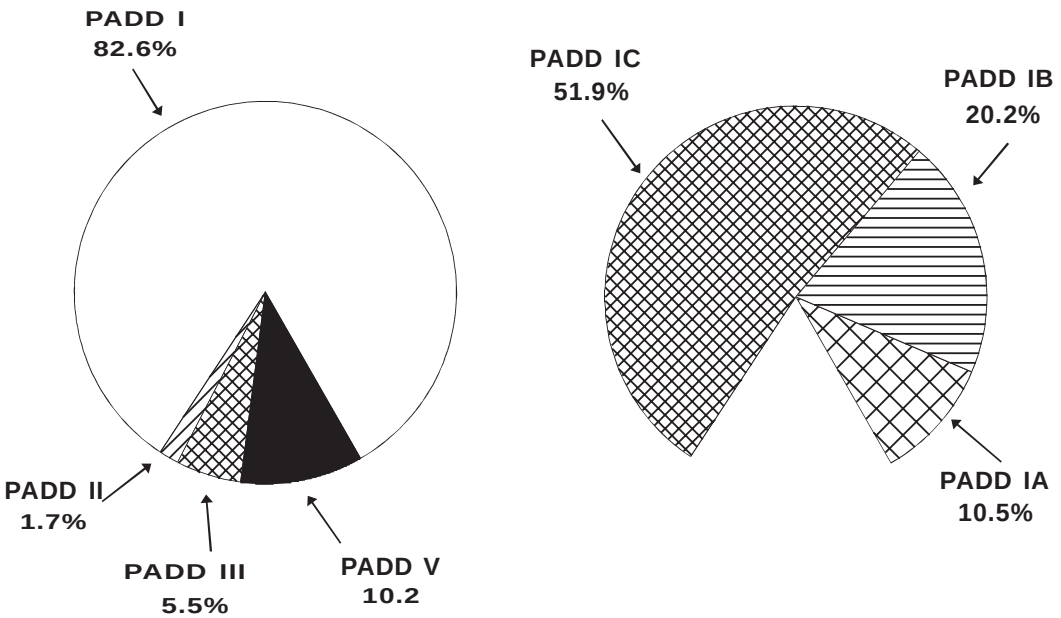
Sources: Energy Information Administration, Form EIA-821, "Fuel Oil and Kerosene Sales Report," 1999 and 2000.

Figure HL3. Distillate and Residual Fuel Oil Sales for Selected End-Use Categories by PAD District, 2000

Distillate: Transportation



Residual: Electric Utility



Sources: Energy Information Administration, Form EIA-821, "Fuel Oil and Kerosene Sales Report," 2000.